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CLAIMS

What is claimed is:

1. A method for controlling a computer using a video image, the method comprising:
 - 5 (a) capturing a video stream, the video stream comprising a plurality of video frames;
 - (b) determining a location of an object in the video stream in at least some of the plurality of video frames;
 - (c) controlling a program executing on the computer based on the location of the object;
 - 10 (d) combining the video stream with a user interface stream generated by the computer operating system, thereby forming a composite video stream; and
 - (e) displaying the composite video stream.
- 15 2. The method of claim 1 wherein capturing a video stream includes receiving a live video signal of a user generated by a video camera.
3. The method of claim 1 wherein capturing a video stream includes receiving a stored video signal from a video storage device.
4. The method of claim 1 wherein determining the location an object in the video stream includes:
 - 20 (a) searching for a predetermined color in the video stream;
 - (b) in response to locating the predetermined color, identifying an occurrence of the predetermined color having the largest area; and
 - 25 (c) determining coordinates of the center of the occurrence of the predetermined color having the largest area.
5. The method of claim 1 wherein controlling a program executing on the computer based on the location of the object:
 - 30 (a) analyzing motion of the object in successive video frames to determine presence of a control event; and
 - (b) controlling the program based on the control event.

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6. The method of claim 5 wherein the video stream comprises an image of a computer user, the object comprises an object associated with the user's hand, and the control event comprises a pointer movement event.
- 5 7. The method of claim 5 wherein the video stream comprises an image of a computer user, the object comprises an object located in the user's hand, and the control event comprises a mouse click event.
8. The method of claim 1 wherein combining the video stream with the user interface stream generated by the computer operating system includes horizontally reversing frames of the video stream to produce a mirror image of the frames of the video stream.
- 10 9. The method of claim 1 wherein combining the video stream with the user interface stream generated by the computer operating system includes transparently overlaying the user interface stream on the video stream.
- 15 10. The method of claim 1 wherein combining the video stream with the user interface stream generated by the computer operating system includes transparently overlaying the video stream on the user interface stream.
- 20 11. The method of claim 1 wherein combining the video stream with the user interface stream generated by the computer operating system includes:
 - (a) adjusting a transparency level of at least one of the user interface stream and video stream; and
 - (b) generating the composite stream from the user interface stream and the video stream.
- 25 12. The method of claim 11 wherein adjusting the transparency level includes dynamically adjusting the transparency level.
13. The method of claim 1 wherein displaying the composite video stream includes projecting the composite video stream.

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14. The method of claim 1 comprising combining a plurality of different video streams with the user interface stream and displaying the different streams with the user interface stream.
15. The method of claim 14 wherein at least some of the video streams originate from stored video signals.
16. A method for combining a video image of a user with a computer desktop interface, the method comprising:
- (a) capturing a video stream of a user, the video stream comprising a plurality of video frames;
 - (b) transparently combining the video stream with a computer desktop generated by the computer operating system, thereby forming a composite video stream; and
 - (c) displaying the composite video stream, wherein the composite image includes a transparent image of the user displayed with the computer desktop.
17. The method of claim 16 wherein capturing the video stream of the user includes receiving a live video signal generated by a video camera.
18. The method of claim 16 wherein combining the video stream with the user interface stream generated by the computer operating system includes horizontally reversing frames of the video stream to produce a mirror image of the frames of the video stream.
19. The method of claim 16 wherein combining the video stream with the user interface stream generated by the computer operating system includes:
- (a) adjusting a transparency level of at least one of the user interface stream and video stream; and
 - (b) generating the composite stream from the user interface stream and the video stream.
20. The method of claim 19 wherein adjusting the transparency level includes dynamically adjusting the transparency level.

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21. The method of claim 16 wherein displaying the composite video stream includes projecting the composite video stream.
22. The method of claim 16 wherein displaying the composite video stream includes displaying the composite video stream on a non-projection computer display device.
23. The method of claim 16 wherein displaying the composite video stream includes displaying a mirror image of the user with the desktop.
24. The method of claim 16 comprising controlling objects on the desktop in response to movement of the user image.
25. The method of claim 23 wherein controlling objects on the desktop includes moving objects on the desktop.
26. The method of claim 23 wherein controlling objects on the desktop includes activating programs associated with objects on the desktop.
27. The method of claim 16 wherein the desktop comprises the desktop of a computer local to the user.
28. The method of claim 16 wherein the desktop comprises the desktop of a computer remote from the user.
29. The method of claim 16 comprising transparently combining and displaying a plurality of video streams with the computer desktop, wherein each of the plurality of video streams includes an image of a different user.
30. The method of claim 28 comprising controlling desktop objects in response to movement of user images in any of the video streams.
31. A computer-readable storage medium containing a set of computer-executable instructions, the set of instructions comprising:
- (a) a video stream capturing routine for capturing a video stream, the video stream comprising a plurality of video frames;
 - (b) a video frame analysis routine for determining a location of an object in at least some of the plurality of video frames;
 - (c) a driver for controlling a program executing on the computer based on the location of the object;

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- (d) a video compositing routine for combining the video stream with a user interface stream generated by the computer operating system, thereby forming a composite video stream; and
 - (e) a video display routine for displaying the composite video stream.
- 5 32. The computer-readable storage medium of claim 30 wherein the user interface driving routine comprises:
- (a) instructions for searching for a predetermined color in the video stream;
 - 10 (b) instructions for identifying an occurrence of the predetermined color having a largest area; and
 - (c) instructions for determining the coordinates of the center of the occurrence of the predetermined color having the largest area.
33. The computer-readable storage medium of claim 31 wherein the video compositing routine comprises:
- 15 (a) instructions for adjusting the transparency level of at least one of the user interface stream and the video stream; and
 - (b) instructions for generating the composite stream from the user interface stream and the video stream.
- 20 34. The computer-readable storage medium of claim 30 wherein the video compositing routine comprises instructions for horizontally reversing images of the video stream to produce a mirror image of the images of the video stream.
- 25 35. A computer program product comprising computer-executable instructions embodied in a computer readable medium for performing steps comprising:
- (a) receiving a video image of a computer user;
 - (b) combining the video image of the computer user with a computer desktop image;
 - (c) displaying the combined image;
 - 30 (d) tracking a portion of the user image in the combined image; and

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(e) manipulating objects in the desktop image based on the tracked portion.

36. The computer program product of claim 35 wherein manipulating objects includes highlighting the objects.

5 37. The computer program product of claim 35 wherein manipulating objects includes moving the objects.

38. The computer program product of claim 35 wherein manipulating objects includes activating programs associated with the objects.

39. A computer system comprising:

10 (a) a display device;

(b) a video camera for producing a video stream of a user; and

(c) a processing unit operatively coupled to the display device and video camera, wherein the processing unit is adapted to:

15 (i) receiving the video stream of user, the video stream comprising a plurality of video frames;

(ii) determine a location of a predetermined object associated with the user some of the plurality of video frames; and

(iii) control execution of a program based on the location of the object.

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